

Landscape tools to support the educational use of school grounds

Eszter Jákli*

Hungarian University of Agriculture and Life Sciences, Institute of Landscape Architecture, Urban Planning and Garden Art

*Correspondence: jakli.eszter@uni-mate.hu

SUMMARY

Recent years have seen an increasing emphasis on child-friendly concepts in landscape architecture and urban planning, as well as a growing emphasis on school grounds and environmental education, both in terms of pedagogy and landscape design. School grounds provide places for active engagement with the environment, for experiencing what is taught in class, and, are therefore of particular importance for education and for building children's connection with nature. The aim of this research is to develop a set of landscape architecture tools that can be used to promote child-friendly and education-centered design of school grounds. The research collects and organises the different school ground features, drawing on literature research, and the analysis of the Framework Curriculum. The toolkit presented in this paper lists and evaluates each feature according to its function, its relevance to school subjects and the specific knowledge or skills it can help to acquire, its space requirements and feasibility. To conclude, school grounds offer opportunities for teaching almost any subject and can therefore be linked to educational activities in multiple ways. The results of this research are to be developed into design guidelines in order to be used by designers and teachers alike, to help develop school grounds contributing to the well-being and environmental awareness of new generations.

Keywords: school grounds; school landscape; landscape architecture; environmental education

INTRODUCTION

The issue of school gardens and environmental education is receiving increasing attention, both in terms of pedagogy and environmental education (see e.g. the National School Garden Development Program initiated by the Ministry of Agriculture, the extensive activities of the Foundation for School Gardens, and various national and international program and strategies: National Environmental Education Strategy, National Environmental Protection Program, National Landscape Strategy, European Landscape Convention), not to mention the relevance of sustainability and environmental issues. In addition, in recent years, child-friendly concepts have gained increasing ground in landscape architecture and urban planning, together with the involvement of children and young people in participatory planning (Derr et al., 2018; Danenberg et al., 2018; Jákli et al., 2022). This phenomenon has also drawn attention to the importance of school grounds, and several national initiatives and projects have focused on this area in Hungary as well. For example, the Play-friendly Schools project, took place in 2017 and 2019, aiming to create opportunities for free play in school gardens (Vastag et al., 2019). In 2019, the aforementioned National School Garden Development Program was launched (AM, 2019), which focuses on school gardens, and two other Erasmus+ funded projects: The Ladder (“Laboratory with Students for a Democratic Environment”) project aims at the democratic transformation of school environments (LADDER, 2020), and the Pappus (“Plants and Play Promoting Universal Skills”) project explores the impact of children's activities in nature (PAPPUS, 2020).

A research on mapping the situation and environmental education potential of school grounds in Budapest found that school grounds do not meet the

standards of the Hungarian Standards Board's standard MSZE 24203-2:2012. The degree of built-in areas exceeds the allowed degree in a significant number of schools, therefore there is a lack of open space in the case of many schools. However, there is a need and interest towards the educational use of the school grounds, some of the analysed schools have already a high potential for environmental education with several functions and elements supporting it (Jákli and Boromisza, 2021).

Based on this need, the aim of the present research is to create a set of landscape architecture tools that can be used by landscape architects and educators alike to promote child-friendly and educationally oriented school grounds in the future, taking into account physical and material constraints as well.

MATERIALS AND METHODS

The study is built on several materials. First of all, a literature review was conducted to get to know the current, mostly international trends in the landscape architecture of school grounds. The next step was the study and analysis of the Framework Curriculum for the 2020 National Curriculum for state primary schools in Hungary (OH, 2020). For each primary school subject, the author reviewed the suggested tasks and activities related to each subject in the Framework Curriculum that can be implemented in the school ground, and most of the activities were associated with specific landscape tools, school ground areas and elements.

Listed school ground features were evaluated and categorised based on landscape architectural standards and on the findings of prior field studies in the school grounds of 21 state primary schools in Budapest (Jákli and Boromisza, 2021), and the experiences gained during participatory projects of the Ladder project (LADDER, 2020).

RESULTS AND DISCUSSION

International research has shown that the school ground is not just a place to 'blow off steam' and release tension, but also an extended place for learning (Malone and Tranter, 2003), and that greening open spaces contributes to a connection with nature (Bell 2001; Nabhan and Trimble, 1994; Tranter and Malone, 2004) and increases learning opportunities (Capra et al., 1999). In Western Europe, North America and Australia, there are a number of initiatives that seek to put this principle into practice (Moore, 2006). There are a number of publications that advocate the development of 'green schoolyards' and provide practical suggestions for their implementation (e.g. Grant and Littlejohn, 2001; Philps, 2002; Dymont, 2005; Bell and Dymont, 2006; Wolf et al., 2014; Community Design Collaborative, 2015). In North America, there is a growing trend to transform 'traditional' play spaces into play spaces where exploration, imagination and nature play a central role (White and Stoecklin, 1998; White, 2004). These unstructured spaces provide a space for children's free, intrinsically motivated play. Free play areas are dominated by vegetation rather than built features. These playgrounds are designed from the children's perspective, with the aim of creating informal, nature-based spaces that stimulate children's natural curiosity, imagination and exploration, while fostering a connection between children and nature (White and Stoecklin, 1998). Important elements of outdoor play spaces include the different forms of water, dense, wild, native vegetation that invites exploration, and the presence of different animals such as birds and insects that use the vegetation or water as a habitat. Sand is an important element of the free play area, especially when used in combination with water, and the variety of colors, textures and materials is also important, as is the opportunity to experience the diversity of nature (White and Stoecklin, 1998; Vastag et al., 2019).

The analysis of the Framework Curriculum has found that in the first 4 years of the primary school (1–4th grade) there are 17 topics of 7 subjects, and in the second 4 years (5–8th grade) there are 28 topics of 10 subjects of the Hungarian National Curriculum, that are connected to the school ground, requiring or allowing schoolwork outside of the classroom. *Table 1* and *2* summarises the mentioned subjects and topics with the joining activities, explaining which school ground feature can be used for that special activity. The relationship to the school ground is very complex

during the primary schools. There is a high range of activities that can be carried out in the school ground, from observing plants, animals or different weather conditions, practicing orientation in space or learning about shapes to actively shaping their environments such as doing gardening or manual works. The curriculum of the subject of Visual Culture even suggests an activity where pupils are to work directly with the school ground: they need to create a plan and a model about the transformation of the school ground: it is already a landscape architectural task in fact.

As a result of the literature review and the analysis of the Frame Curriculum, a 40-element list was created, with the following elements: area for gatherings and play, bird feeder, bird-friendly garden, butterfly garden, colourful walls and pavements, graffiti wall, compost bin, display garden, educational games, flowering plants, free play area, fruit trees, garden of the senses (scent garden), garden pond, green roof, herb bed, loose parts, meteorological station, multi-layered vegetation, nature trail, outdoor classroom, outdoor space for experiments, outdoor sports equipment (fitness, ping-pong), performance space/stage, plants with a special appearance, collectible plants, play equipment, pollinator-friendly plants, rain garden, rainwater collector, rest area, sandpit, sculpture, installation, seating platform, shelter for animals (birdhouse, insect hotel, frog house, hedgehog garage), sports field, trees for climbing, undisturbed part of the garden, vegetable garden, vertical green spaces, visual aids, wet games.

Five different functions were named in the research and school ground elements were categorised into one or more of them (*Table 3*). The five main functions of the school ground are sport and games, recreation, education, community functions and identity creation, and ecological function. As we can see in the table, most of the elements belong to more than one function. In fact, only the meteorological station is considered monofunctional (it has educational function). Almost all the elements listed belong (among others) to the educational function (35), only some are considered solely for playing – however learning by playing is an informal way of education, thus they can be considered to contribute to the educational functions as well. Besides education, elements with ecological function (24) and with community and identity creating function (21) are also frequent. There are 18 elements with play and sport function and 11 with recreational function (*Figure 1*).

Table 1. Subject-related school ground activities, school ground elements and landscape tools in the 1–4th grades

SUBJECT	TOPIC	TASKS, ACTIVITIES, STUDY MATERIAL	LANDSCAPE ARCHITECTURE TOOL / SCHOOL GROUND ELEMENT
HUNGARIAN LANGUAGE AND LITERATURE	Stories, poems	Observation of plants and animals in the school ground in stories and poems	multi-layered vegetation, demonstration garden, vegetable garden, habitats, shelter for animals
MATHEMATICS	Calculation and estimation	counting outdoor objects, estimating distances	trees, garden objects e.g. bench, play equipment
	Transformation	observing symmetries and reflections in the natural and built environment	colourful, painted pavements and walls, symmetrical garden composition
	Orientation in space and plane	orientation games, activities in the school ground, walking routes	area for gathering and play, lawn area, varied landscaping, multi-layered vegetation, garden objects as landmarks
	Recognising connections, relationships, regularities	Observing the seasons in the school ground, one of the familiar periods in our daily lives	multi-layered vegetation, ornamental plants for different seasons
	Measuring instruments, measurement methods	Measurement of perimeter: by measuring the circumference of an outdoor object/tree	trees, garden objects
ENVIRONMENTAL STUDIES	Observation, measurement	observing weather features, parts of herbaceous and woody plants, the condition of plants, changes in their properties in response to environmental influences	multi-layered vegetation, meteorological station
	Getting your bearings in time	changing of the seasons and times of day, the typical weather of each season, weather factors and measuring temperatures, daily and annual rhythms of flora and fauna, different life stages of plants	multi-layered vegetation, habitats, shelter for animals, vegetable gardens, ornamental plants
	Orientation in space	identifying the points of the compass	
	Biomes in our living environment	creation and observation of a bird-friendly garden, monitoring microhabitats, vegetable garden maintenance	micro-habitats (garden ponds, bird boxes, bird feeders, bird and insect attractants, etc.), shelter for animals, vegetable gardens
MUSIC	Songs	observing plants in songs	multi-layered vegetation, ornamental perennials, fruit trees, flowers
VISUAL CULTURE	Natural and artificial environment - Real and fictional objects	pattern design by simplifying collected natural forms	collectible plants, plants with special appearance, flowering plants
	Natural and artificial environment - Our immediate environment (grades 1–2)	Observation and visualisation of the school ground with different techniques, in space and time	variety of school ground design (colours, shapes, planting, landscaping, etc.), aesthetics
	Natural and artificial environment - Our immediate environment (grades 3–4)	creating images and objects from natural forms according to the seasons, making a plan and a model for the transformation of the school ground	collectible plants, plants with special appearance, flowering plants
TECHN. AND DESIGN	Materials in our environment	collecting natural materials, leaves, fruits: fruit figures, fruit puppets, making pictures, leaf pressing	collectible plants, plants with special appearance, flowering plants
	Home -- family – lifestyle	care of the vegetable garden	vegetable garden
PE		outdoor sports activities, outdoor folk games	sports fields, area for gathering and play, lawn area



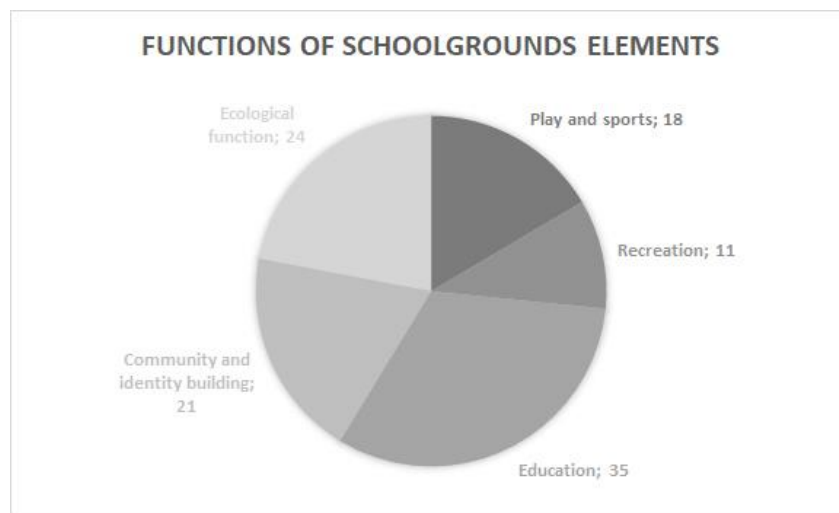
Table 2. Subject-related school ground activities, school ground elements and landscape tools in the 5–8th grades

SUBJECT	TOPIC	TASKS, ACTIVITIES, STUDY MATERIAL	LANDSCAPE ARCHITECTURE TOOL / SCHOOL GROUND ELEMENT
HUNG. LANG. AND LIT.	Literary works	Learning about plants in literary works	multi-layered vegetation
MATHEMATICS	Measurement and units	Estimation and measurement of school ground and school building data	
	Planar shapes	school ground observation from a geometric point of view	the use of geometric shapes in garden composition
	Transformations	finding congruent parts of the school ground, axially/centrally symmetrical shapes	the use of geometric shapes and symmetry in garden composition
	Space geometry	school ground observation from a geometric point of view	the use of geometric shapes in garden composition
NATURE SCIENCE	Materials and their properties	carry out simple experiments to determine soil properties, examination of typical herbaceous and woody plant parts with a magnifying glass	multi-layered vegetation
	Measurements, units, measuring instruments	making estimates and measurements in the school grounds using relevant measuring instruments to determine temperature, length, mass, volume and time	garden objects, trees, outdoor classroom/experimental space
	Orientation in time	observing the seasons and the changing of the seasons	multi-layered vegetation, ornamental plants, flowers
	Basic cartographic knowledge	solving exercises in the school ground with a compass	varied landscaping, garden objects, mature trees, multi-layered vegetation
	Practical cartographic skills	draw a sketch map of the school ground, a field orienteering exercise in the school ground, using a map, compass and/or GPS	varied landscaping, garden objects, mature trees, multi-layered vegetation
	Body structure of plants	observing the development of annual plants, observation of plant organs with a magnifying glass	vegetable garden, herbaceous plants, flowerbed
	Body structure of animals	observation of animal organs with magnifying glass, observation of animals	bird feeders, habitats, shelter for animals
	Forest community and its natural-environmental problems	morphology, bark, leaf, flower, fruit observation, plant identification exercise	multi-layered vegetation, native plants, undisturbed area, nature trail
	Medow and farmland community and its natural-environmental problems	plant identification exercise, medicinal plants and their uses, study of the body structure of grasses	multi-layered vegetation, native plants, herbs, lawns, undisturbed garden area
	Aquatic and riparian communities and their natural-environmental problems	body composition of aquatic and riparian plants	garden pond, rain garden
Basic atmospheric phenomena and processes	making and using a weather station, weather monitoring project: measurement tasks	meteorological station	
CHEMISTRY	Chemistry in nature	Investigating the chemistry of rainwater, making a compost bin	rainwater harvester, compost bin
PHYSICS	Momentum and balance	observing circular movements and oscillations, measuring periodic time	swings, swinging toys, visual aids
	Lighting, light, optical instruments	observing and photographing shadows in the environment	outdoor classroom
	Waves	creating and observing rainbows in nature	outdoor classroom/experimental space
	The global problems of our environment	observing the light absorption properties of dark and light surfaces in the school ground	different coloured surfaces, varied colours

Table 2. continued

SUBJECT	TOPIC	TASKS, ACTIVITIES, STUDY MATERIAL	LANDSCAPE ARCHITECTURE TOOL / SCHOOL GROUND ELEMENT
BIOLOGY	Countries of the wildlife	recognising important plants and animals	multi-level vegetation, habitats, shelter for animals
	Investigation of biotic communities	regular monitoring of schoolyard microhabitats, investigating the distribution of lichens in the school environment	habitats, shelter for animals
GEO-GRAPHY	Orientation in geographical space	using compass, map, GPS, determining distance and location in the field	varied landscaping, garden objects, multi-level vegetation
VISUAL CULTURE	Environment: technology and tradition - Objects, spaces, function (grades 5-6)	redesigning and transforming real spaces in the school ground, based on examples, identify and analyse a specific problem in order to usefully transform the school ground, visually capture ideas for a solution, and develop, model and present a final solution proposal	
TECHN. AND DESIGN	Horticultural techniques (module C)	vegetable garden care (vegetable plants, herbs)	vegetable garden, herb bed, compost bin
PE		outdoor sports activities, outdoor folk games	sports fields, area for gathering and play, lawn area, outdoor gym equipment

Figure 1. Functions of school ground elements (number of elements)



Regarding the school curriculum, Table 4 shows the subject relations of each school ground feature. Most of the school ground elements are connected to the subjects of nature sciences (19), biology (16) and environmental studies (14). Besides these, the potential use of the school ground also appears in higher proportion in the curriculum of Hungarian language

and literature, Technique and design, Visual culture and Physical education (Figure 2), so it can contribute to a wide range of subjects. Besides the school subjects, free time activities also take place in the school ground which – besides recreation, play and sports – might contribute to informal learning activities, through the concepts of learning by doing, and learning by playing.

Table 3. Functions, space requirements and feasibility of school ground features

SCHOOL GROUND FEATURE	FUNCTIONS (1–4)							SPACE REQUIREMENTS (1–3)	FEASIBILITY (1–3)
	play and sport recreation	education	community and identity building	ecological					
area for gatherings and play	4	0	1	2	0	3	3		
bird feeder	0	0	4	1	4	1	1		
bird-friendly garden	0	2	4	0	4	2	1		
butterfly garden	0	2	4	0	4	1	1		
colourful walls and pavements, graffiti wall	2	0	3	4	0	1	1		
compost bin	0	0	4	0	4	1	1		
display garden	1	0	4	2	3	2	2		
educational games	2	0	4	0	0	1	1		
flowering plants	1	2	4	2	3	1	1		
free play area	4	0	0	2	0	3	1		
fruit trees	0	0	4	2	3	2	1		
garden of the senses (scent garden)	0	0	2	0	4	2	1		
garden pond	0	1	4	2	4	2	3		
green roof	0	0	1	0	4	2	3		
herb bed	0	1	4	2	3	2	2		
loose parts	4	0	0	0	1	3	1		
meteorological station	0	0	4	0	0	2	3		
multi-layered vegetation	3	3	4	0	4	2	2		
nature trail	1	1	4	2	4	3	2		
outdoor classroom	0	0	4	1	0	3	3		
outdoor space for experiments	0	0	4	1	0	2	2		
outdoor sports equipment (fitness, ping-pong)	4	0	2	2	0	2	3		
performance space/stage	0	0	4	4	0	3	3		
plants with a special appearance, collectible plants	2	1	4	1	3	1	1		
play equipment	4	0	1	2	0	2	3		
pollinator-friendly plants	0	0	2	0	4	1	1		
rain garden	0	2	4	0	4	2	2		
rainwater collector	0	0	4	0	4	1	1		
rest area	0	4	2	4	0	2	3		
sandpit	4	0	0	0	0	1	1		
sculpture, installation	0	0	3	4	0	1	2		
seating platform	4	0	2	2	0	3	3		
shelter for animals (birdhouse, insect hotel, etc.)	0	0	4	0	4	1	1		
sports field	4	0	4	2	0	3	3		
trees for climbing	4	0	0	0	1	2	2		
undisturbed part of the garden	2	1	4	1	4	3	1		
vegetable garden	0	0	4	2	2	2	2		
vertical green surfaces	0	0	1	0	4	1	3		
visual aids	0	0	4	0	0	1	1		
wet games	4	0	0	0	1	2	3		

Figure 2. Subjects and the number of supporting school ground features

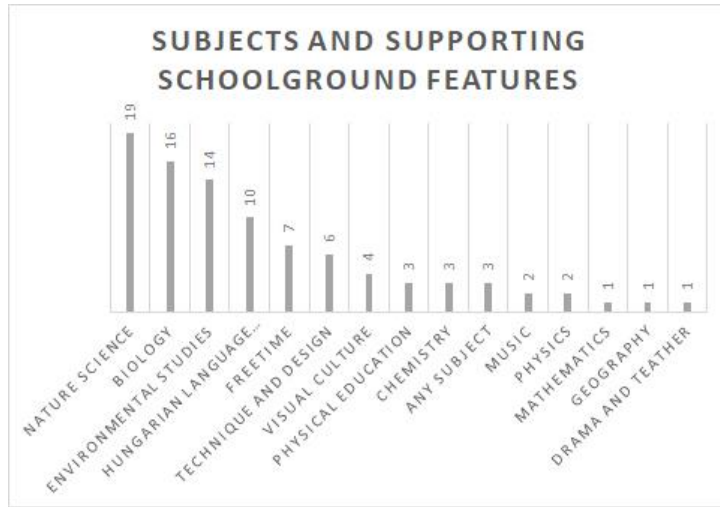


Table 4. Related subjects and acquirable knowledge and skills by school ground features

SCHOOL- GROUND FEATURE	RELATED SUBJECTS														KNOWLEDGE AND SKILLS																	
	Hungarian language and literature	Mathematics	Environmental studies	Music	Visual culture	Technique and design	Physical education	Nature science	Chemistry	Physics	Biology	Geography	Drama and theatre	Any subject	Freetime activity	social skills	motoric skills	manual skills	creativity	drawing, painting, artistic representation	colours, theory of colours	pieces of art (literature, music, etc.)	performance skills	plant knowledge	plant care	knowledge of animals	care of animals	rainwater circulation and management	scientific laws	sustainability		
area for gatherings and play														x	x	x																
bird feeder	x						x										x									x	x					
bird-friendly garden	x		x				x			x															x		x					
butterfly garden	x		x				x				x														x		x					
colourful walls and pavements, graffiti wall		x			x						x									x	x	x										
compost bin						x			x																					x	x	
display garden	x						x				x														x							
educational games														x																		
flowering plants	x		x		x	x			x			x						x							x	x						
free play area															x	x			x													
fruit trees	x		x	x					x			x													x	x						
garden of the senses			x						x			x													x							
garden pond	x		x						x			x													x	x	x					x
green roof			x						x			x													x							x
herb bed						x			x			x						x							x	x						
loose parts														x				x	x													
meteorological station													x																			x
multi-layered vegetation	x		x	x					x			x													x							

Table 4. continued

SCHOOL-GROUND FEATURE	RELATED SUBJECTS											KNOWLEDGE AND SKILLS																		
	Hungarian language and literature	Mathematics	Environmental studies	Music	Visual culture	Technique and design	Physical education	Nature science	Chemistry	Physics	Biology	Geography	Drama and theatre	Any subject	Freetime activity	social skills	motoric skills	manual skills	creativity	drawing, painting, artistic representation	colours, theory of colours	pieces of art (literature, music, etc.)	performance skills	plant knowledge	plant care	knowledge of animals	care of animals	rainwater circulation and management	scientific laws	sustainability
nature trail							x																x		x			x	x	
outdoor classroom														x																
outdoor space for experiments								x	x																				x	
outdoor sports equipment						x										x														
performance space													x							x	x									
plants with a special appearance, collectible plants		x		x	x		x			x							x		x				x							
play equipment														x																
pollinator-friendly plants		x					x			x													x		x					x
rain garden							x																x				x			x
rainwater collector								x																			x			x
rest area														x		x														
sandpit														x		x		x												
sculpture, installation					x	x											x	x	x		x									
seating platform							x									x														
shelter for animals	x	x					x			x							x						x		x	x				
sports field							x									x	x													
trees for climbing														x										x						
undisturbed part of the garden	x	x					x			x													x		x					x
vegetable garden		x			x		x			x							x						x	x						
vertical green surfaces			x				x			x														x						x
visual aids														x																x
wet games														x		x	x		x									x		

The knowledge and skills that can be acquired have a wide variety from plant knowledge to social skills and creativity, altogether 15 skills and knowledge types were differentiated. Acquirable knowledge include plant knowledge, plant care, knowledge about animals, caring for animals, sustainability issues, rainwater circulation and management, scientific laws, colours and colour theory and knowledge of pieces of art. The following acquirable skills were identified: social skills, motoric skills, manual skills, creativity, drawing, painting and artistic representation and performance skills. In overall, it is visible that interaction with the

outside world and activities in the school ground can potentially help increase many different skills and knowledge of school children, both scientific and artistic knowledge and skills, as well as others, thus it is worth exploiting and taking advantage of the potentials of a school ground. The list of possible knowledge and skills can be found in Table 4. Figure 3 shows the number of school ground features related to certain skills and knowledge.

The analysis of space requirements (Table 3) shows that the different school ground elements vary between point-like objects and objects that require large



extension areas. *Figure 4* represents the number of each category. As visible, most of the elements are point-like or require middle extension area. This means that even in school grounds with limited space, which is a frequent problem in Budapest and probably in other towns in Hungary as well (Jákli and Boromisza, 2021), there are several possibilities for development. Point-like objects include for example flowering plants, educational games and visual aids, bird feeders, installations or vertical green surfaces as well. Among these features, there are many options for educational, recreational and ecological functions, and also community and identity building. However sport and play functions usually require more space.

Figure 3. Number of school ground features related to skills and knowledge

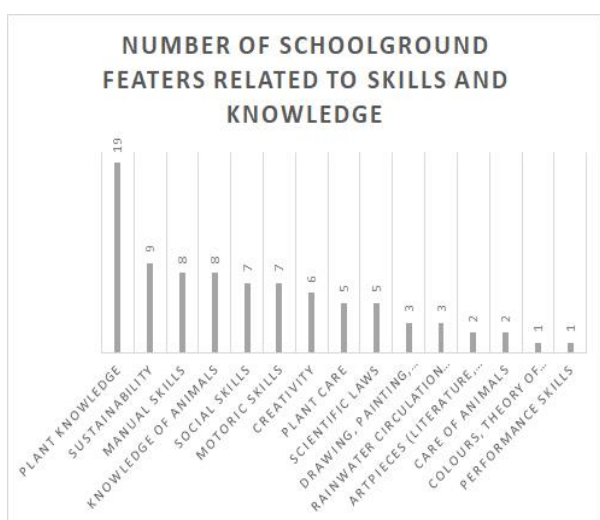
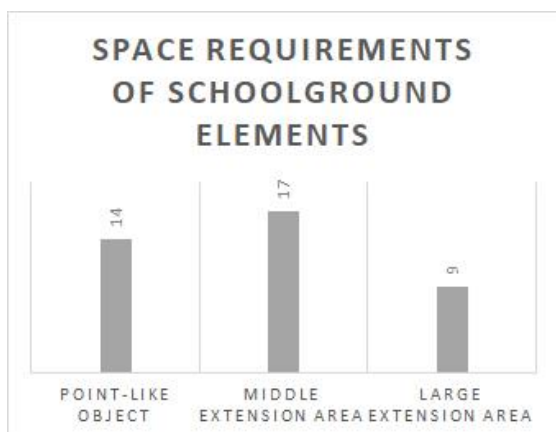


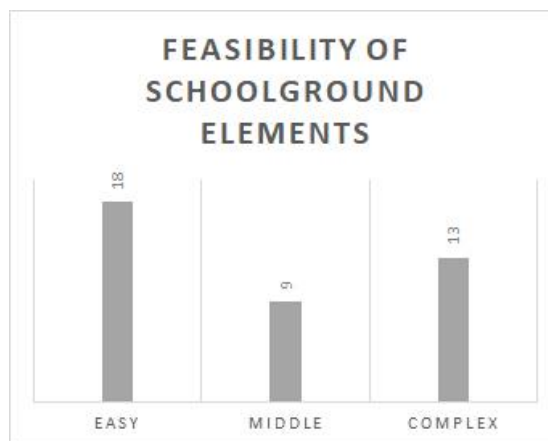
Figure 4. Space requirements of school ground features (number of elements)



Regarding feasibility (*Table 3*), there are school ground features with easy to complex feasibility. Almost half of the potential elements can be easily implemented, while a third of them are complex task which require a professional landscape architect to design (*Figure 5*). On the other hand, easily

implementable elements can be realised by the school community itself which allows for a flexible school ground development, even in case of limited material resources as well.

Figure 5. Feasibility of school ground features (number of elements)



CONCLUSIONS

To conclude, there are several options to develop a school ground. Many of the potential school ground elements are multifunctional, and can serve two, three or even four functions of the school ground at the same time. Education is a very important function as there is a huge potential in school grounds to contribute to the curriculum. As seen from the results, there are several subjects that can use the benefits of the school ground, in fact, any subject can take advantage of it, even by getting outside for an outdoor class in the outdoor classroom. Pupils can gain scientific and artistic knowledge on the school grounds and develop their social, motoric and artistic skills, even meanwhile playing outside.

Renewing or developing a school ground is a task that offers many beauties, many potentials and at the same time several difficulties. Unfortunately most of the state schools have limited space and limited resources thus the task of a school ground renewal has many constraints. However, after analysing the potentials and the potential school ground features, it is clear that many of the listed school ground elements require little space, and/or little resources to accomplish. These can offer possibilities and help develop school grounds step by step, even by the school community itself, part of a participatory project, which itself has great educational potential (Jákli et al., 2022).

In the long run, the author aims to create a design guideline which can support both professionals and school communities in designing and renewing school grounds, in order to have school grounds that better fit the aim of education meanwhile also being child-friendly where children can play, relax and learn in a safe and inspiring environment.



ACKNOWLEDGEMENTS

Supported by the ÚNKP-22-4-II New National Excellence Program of the Ministry for Culture and

Innovation from the source of the National Research, Development and Innovation Fund.

REFERENCES

- AM [2019]: Bővíti az Országos Iskolakert-fejlesztési Programot az Agrárminisztérium. Available online: <https://www.kormany.hu/hu/foldmuvelesugyi-miniszterium/kornyeztugyert-felelos-allamtitkarsag/hirek/boviti-az-orszagos-iskolakert-fejlesztési-programot-az-agrarminiszterium> (accessed on 3 July 2019)
- Bell, A.C. (2001): Engaging spaces: On school-based habitat restoration. *Canadian Journal of Environmental Education* 6/1. pp. 209–224.
- Bell, A.C.–Dyment, J.E. (2006): Grounds for Action: Promoting Physical Activity Through School Ground Greening in Canada. Evergreen: Toronto, Canada. Available online: <https://www.evergreen.ca/downloads/pdfs/Grounds-For-Action.pdf> (accessed on 12 December 2022)
- Capra, F.–Comnes, L.–Cook, E.–Hawkins, D.–Jackson, W.–McCullough, Y.–Waters, A. (1999): The Edible Schoolyard. Center for Ecoliteracy, Berkeley, CA, USA.
- Community Design Collaborative (2015): Transforming Philadelphia's Schoolyards. Community Design Collaborative: Philadelphia, PA, USA. Available online: <https://cdesignc.org/uploads/files/547129531651180934-collaborative-transforming-philadelphias-schoolyards-guide.pdf> (accessed on 12 December 2022)
- Danenberg, R.–Doumpa, V.–Karsserberg, H. (2018): The city at eye level for kids. STIPO Publishing: Rotterdam, the Netherlands, 394 p.
- Derr, V.–Chawla, L.–Minzer, M. (2018): Placemaking with Children and Youth: Participatory Practices for Planning Sustainable Communities. New Village Press: New York, USA, 416 p.
- Dyment, J.E. (2005): Gaining ground: The power and potential of green school grounds in the Toronto District School Board. Evergreen: Toronto, Canada. Available online: <https://www.evergreen.ca/downloads/pdfs/Gaining-Ground.pdf> (accessed on 12 December 2022)
- Grant, T.–Littlejohn, G. (2001.): Greening School Grounds: Creating Habitats for Learning. New Society Publishers: Gabriola Island, BC, USA.
- Jákli, E.–Boromisza, Zs. (2021): Fővárosi iskolakertek vizsgálata a környezeti nevelés tükrében: Analysis of school grounds in Budapest, in the context of environmental education. 4D Tájépítészeti és Kertművészeti Folyóirat / *Journal of Landscape Architecture and Garden Art*, 59, pp. 52–71. <https://doi.org/10.36249/59.4>
- Jákli, E.–Reith, A.–Almási, B.–Pap, M. (2022): The role of participatory planning in designing school environments. In Proceedings of the Fábos Conference on Landscape and Greenway Planning, 7, Paper 23, pp 1–11. <https://doi.org/10.7275/6rjv-gj45>
- LADDER [2020]: Ladder project. Available online: <https://www.facebook.com/Ladder-project-104639894473369/> (accessed on 30 March 2023)
- Malone, K.–Tranter, P. (2003): Children's Environmental Learning and the Use, Design and Management of Schoolgrounds. *Children, Youth and Environments*, 13/2. pp. 87–137.
- Moore, R.C. (2006): Playgrounds: A 150-Year-Old Model. In Safe and Healthy School Environments. Editor Frumkin, H.–Geller, R.–Rubin, L.I.–Nodvin, J. Oxford University Press: New York, USA. pp. 86–103.
- Nabhan, G.P.–Trimble, S. (1994): The Geography of Childhood: Why Children Need Wild Spaces. Beacon Press: Boston, MA, USA.
- OH (2020): Oktatási Hivatal. A 2020-as NAT-hoz illeszkedő tartalmi szabályozók. Available online: https://www.oktatas.hu/koznevelés/kerettantervek/2020_nat (accessed on 1 December 2022.)
- PAPPUS [2020]: Plants and Play Producing Universal Skills. Available online: <https://pappusproject.eu/the-project> (accessed on 3 March 2020)
- Tranter, P.J.–Malone, K. (2004): Geographies of environmental learning: An exploration of children's use of school grounds. *Children's Geographies*, 2/1. pp. 131–155. <https://doi.org/10.1080/1473328032000168813>
- Vastag, Zs.–Suhajda, É.V.–Russell, W.–Burton, L.–Conibere, K. (2019): A Játékbárát Iskola cím – Kézikönyv iskolák részére. 73 p. Available online: https://bfc236e5-1361-4474-8eb4-5500bfee4e90.filesusr.com/ugd/5d4978_1e8a65f53e014804a302a127106803da.pdf (accessed on 15 February 2023)
- White, R. (2004): Young Children's Relationship with Nature: Its Importance to Children's Development & the Earth's Future. Available online: http://www.childrenandnature.org/uploads/White_YoungChildren.pdf (accessed on 15 December 2022)
- White, R.–Stoecklin, V. (1998): Children's Outdoor Play & Learning Environments: Returning to Nature. Available online: www.whitehutchinson.com/children/articles/outdoor.shtml (accessed on 15 December 2022)
- Wolf, U.–Tiedtke-Klugow, A.–Dietzen, M. (2014): Advisory service for the ecological, child-friendly design of school yards and kindergarten. Educational advisory service "Grün macht Schule" of the Berlin Senate Department for Education, Youth and Science, Berlin. Available online: http://www.gruen-macht-schule.de/images/downloads/Imagebroschuere_Gruen_macht_Schule-english.pdf (accessed on 12 December 2022.)